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3 (Sem-4/CBCS) ZOO HC 1

2022

ZOOLOGY

(Honours)

Paper : ZOO-HC-4016

(Comparative Anatomy of Vertebrates)

Full Marks : 60

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

1. Answer **any seven** of the following : 1×7=7
- (a) The layer that separates the skin from deeper tissues is
- (i) cuticle
 - (ii) epidermis
 - (iii) dermis
 - (iv) hypodermis

Contd.

(b) The connective tissue beneath the epidermis is known as

- (i) cuticle
- (ii) dermis
- (iii) hypodermis
- (iv) epidermis

(c) The structure that is a part of the skeletal system but are not bones is called

- (i) teeth
- (ii) hairs
- (iii) nails
- (iv) hooves

(d) The total number of bones in an adult human is

- (i) 208
- (ii) 206
- (iii) 350
- (iv) 260

(e) Saliva helps in digestion of

- (i) starch
- (ii) fiber
- (iii) proteins
- (iv) fats

(f) The longest organ of digestive system in human is

- (i) pancreatic duct
- (ii) small intestine
- (iii) large intestine
- (iv) esophagus

(g) The tiny air sacs present in human lungs are called

- (i) alveoli
- (ii) bronchus
- (iii) bronchioles
- (iv) All of the above

- (h) Pulmonary vein carries
- (i) impure blood from lungs
 - (ii) impure blood from heart
 - (iii) pure blood from lungs
 - (iv) pure blood from heart
- (i) The nerves that transmit the impulse to the central nervous system is called
- (i) sensory neuron
 - (ii) motor neuron
 - (iii) sympathetic system
 - (iv) parasympathetic system
- (j) In human eye, the image of an object is found in
- (i) cornea
 - (ii) iris
 - (iii) pupil
 - (iv) retina

2. Write short notes of the following :
(any four) 2×4=8
- (a) Structure of Weberian ossicles
 - (b) Meckel's cartilage in tetrapods
 - (c) Taste buds
 - (d) Gill arch
 - (e) Alveoli
 - (f) Ductus caroticus
 - (g) Pacinian corpuscle
 - (h) Urinogenital duct
3. Answer **any three** of the following :
5×3=15
- (a) Describe the structure of avian epidermis.
 - (b) Write briefly the structure of axial skeleton.
 - (c) Describe different types of teeth found in vertebrates.
 - (d) Write a note on the structure and functions of swim bladder.

(e) Give an account of the ultrastructure of a nephron.

(f) Describe briefly the components of sensory organ.

(g) Afferent branchial arteries in bony fishes

4. Answer **any three** of the following :

10×3=30

(a) Describe the structure and functions of mammalian skin. 7+3=10

(b) Give an account of jaw suspension in vertebrates.

(c) Give a comparative account of digestive system in birds and mammals with diagram. 5+5=10

(d) Give the comparative study of heart in reptiles and birds with diagram.

5+5=10

(e) Describe briefly about the urogenital system of mammals.

(f) Give a detailed account of mammalian brain with diagram. Mention its advancements over reptilian brain.

7+3=10

(g) Give a brief account of visual receptors in man.

(h) What is accessory respiratory organ? Describe the structure and functions of accessory respiratory organs in fishes. 2+(5+3)=10

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3 (Sem-4/CBCS) ZOO HC 2

2022

ZOOLOGY

(Honours)

Paper : ZOO-HC-4026

(Animal Physiology; Life Sustaining System)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill in the blanks : **(any seven)** $1 \times 7 = 7$
- (a) _____ hormone regulates the concentration of urine.
- (b) The matrix of blood is known as _____.
- (c) _____ prevents clotting of blood in blood vessels.
- (d) Collagen, a major constituent of meat is digested by _____ enzyme of stomach.

Contd.

- (e) Lungs consists of numerous small air sacs called _____.
- (f) _____ is the functional unit of kidney.
- (g) Blood pressure is measured in millimetre of _____.
- (h) Crypts of Lieberkuhn found in intestine secretes _____.
- (i) Vitamin _____ is essential for blood clotting.
- (j) _____ discovered the ABO system.

2. Answer very briefly : **(any four)** $2 \times 4 = 8$

- (a) What is chloride shift ?
- (b) Why sinus node is called pacemaker of the heart ?
- (c) Explain briefly the role of liver is digestion.
- (d) Emulsification of fats
- (e) What is haemostasis ?
- (f) How the hormone angiotensin II regulates blood pressure ?
- (g) What is tidal volume ?
- (h) Structure of haemoglobin A.

3. Answer the following : **(any three)** $5 \times 3 = 15$

- (a) Write a short note on carbon monoxide poisoning.
- (b) Define cardiac output. Describe briefly how cardiac output is regulated by Frank-Starling mechanism of the heart.
 $1+4=5$
- (c) Briefly describe how pneumotaxic centre of the respiratory center controls respiration.
- (d) What are the different types of pancreatic enzymes ? Explain with their functions.
 $3+2=5$
- (e) Write a brief note on hormonal regulation of gastric acid secretion in gastrointestinal tract.
- (f) Write a short note on fibrinolytic system.
- (g) Describe the structure of mammalian heart.
- (h) Write a note on haemopoiesis.

4. Answer **any three** from the following questions : $10 \times 3 = 30$

- (a) What is a nephron ? Briefly describe the countercurrent mechanism of urine formation.
 $2+8=10$

- (b) What is erythroblastosis fetalis ? Discuss briefly how a Rh-negative mother can affect a foetus with Rh-positive blood. $2+8=10$
- (c) Briefly describe oxygen-haemoglobin dissociation curve. What are the different factors which influence the oxygen dissociation curve ? $5+5=10$
- (d) Write a note on digestion and absorption of carbohydrate in human body. $5+5=10$
- (e) What are clotting factors ? Describe in detail the mechanism of blood coagulation ? $2+8=10$
- (f) Define cardiac impulse. Explain how a cardiac impulse is originated and generated through the heart ? $2+8=10$
- (g) Write a detail account on the transport of carbon di oxide in blood.
- (h) Define antibodies. Describe the different blood groups found in human. $2+8=10$
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3 (Sem-4/CBCS) ZOO HC 3

2022

ZOOLOGY

(Honours)

Paper : ZOO-HC-4036

(Biochemistry of Metabolic Processes)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill in the blanks : **(any seven)** $1 \times 7 = 7$
- (a) The net result of the glycolytic breakdown of a molecule of glucose is _____ moles of ATP.
- (b) The formation of glucose from non-carbohydrate sources is known as _____.
- (c) The final common pathway for the oxidation of carbohydrates, fat and protein is _____.

Contd.

- (d) _____ proposed that fatty acids are degraded by the sequential removal of two carbon units from the COOH end of the molecule.
- (e) Urea is produced in animals by a cyclic process known as the _____.
- (f) Per molecule of glucose under anaerobic conditions yields _____ moles of ATP.
- (g) The process of conversion of glucose into pyruvate is known as _____.
- (h) _____ is a chemical reaction that transfers an amino group to a ketoacid to form new amino acids.
- (i) _____ links the urea cycle and the citric acid cycle.
- (j) The compound in urine responsible for the color reactions was identified as _____.

2. Answer the following briefly : (*any four*)
2×4=8

- (a) What is the fundamental distinction between NADPH and NADH ?
- (b) Differentiate between saturated and unsaturated fatty acids with examples.
- (c) Write the structure of adenosine triphosphate (ATP) molecule.

- (d) What do you understand by “redox” reactions ?
- (e) State the significance of citric acid cycle.
- (f) What are the causes and consequences of ketosis ?
- (g) State the physiological role of glycogen.
- (h) Write a note on Sir Hans Krebs.

3. Answer *any three* questions from the following :
5×3=15

- (a) Describe Cori’s cycle along with its significance.
3+2=5
- (b) ATP is called the “energy currency of the cell”. Explain.
- (c) Explain the role of triacylglycerols as a major storage of metabolic energy.
- (d) What is deamination ? Describe the glucogenic and ketogenic aminoacids and their deamination.
2+3=5
- (e) Discuss essential and non-essential type of aminoacids with examples.
- (f) Discuss the process of gluconeogenesis and glycogenesis.
2½+2½=5
- (g) Discuss the role of liver in the aminoacids metabolism.
- (h) What is phenylketonuria ? How it affects in the body metabolism ?
2+3=5

4. Answer the following : **(any three)**

10×3=30

- (a) Explain and illustrate the different steps involved in the glycolytic pathway.
- (b) Give an account of β -oxidation of saturated carbon fatty acids (Palmitic acid) along with its energetics.
- (c) Describe the detoxification of ammonia by urea cycle.
- (d) Define Electron-transport system (ETS) or respiratory chain system. Discuss the various steps involved in the system. 2+8=10
- (e) Describe the general sequence of events in the citric acid cycle. Add a note on its "Amphibolic" role. 8+2=10
- (f) What do you mean by metabolism? Describe in detail about the anabolism and catabolism with suitable examples. 2+4+4=10
- (g) Describe briefly on compartmentalization of metabolic pathways.
- (h) Explain the metabolism, biochemical importance and inborn errors of : 5+5=10
- (i) Glycine and
- (ii) Phenylalanine, tyrosine